

REMARKS

Regarding sections 1-2 of the Sept. 26, 2001 Office Action ("Office Action"), Claim 20 was rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 5,747,381, issued to Wu et al. ("Wu").

Claim 20 has been amended to include the aspects of claim 21. Claim 21 has been subsequently canceled. The Applicant respectfully requests that the amendment be entered. It does not appear that amendment to claim 20 should raise additional issues not already raised or require an additional search not already undertaken since issues raised and searches performed regarding claims 20 and 21 since the amended claim 20 is substantially the claim 21 previous to this present amendment. The Applicant would be most interested in hearing the Examiner's views on the issue of entering the amended claim 20 should they differ with the Applicant.

Preliminary Comments on Kuo and Claimed Invention

Claims 1-4, 6-7, 9-10, 21-27 were rejected under 35 USC § 103(a) as being obvious over U.S. Patent No. 5,661,084 to Kuo et al. ("Kuo"). The amended claim 20 is in actuality the rejected claim 21 in independent form, so the amended claim 20 will also be discussed herein.

As to claim 1, Kuo does not teach or suggest, "... a first planarized layer of plasma-enhanced tetraethyl orthosilicate over at least a portion of the layer of the borophosphorous silicate glass, and not overlaying at least a portion of the borophosphorous silicate glass layer...."

Also as to claim 1, Kuo does not teach or suggest "a second layer of plasma-enhanced tetraethyl orthosilicate overlaying the planarized layer of plasma-enhanced tetraethyl orthosilicate and directly overlaying and being in contact with [at least a] the portion of the borophosphorous silicate glass [region] layer, not overlaid by the first layer of plasma-enhanced tetraethyl orthosilicate, the layers of the undoped silicate glass, borophosphorous silicate glass, planarized plasma-enhanced tetraethyl orthosilicate and second plasma-enhanced tetraethyl orthosilicate layer together forming a pre-metal dielectric stack."

As to Claim 6, Kuo does not teach or suggest, "... a planar dielectric layer disposed on the unplanar layer of borophosphorous silicate glass, the planar dielectric layer

directly overlaying at least a portion of the borophosphorous silicate glass and leaving exposed so as to not directly overlay at least a portion of the borophosphorous silicate glass”

Also as to claim 6, Kuo does not teach or suggest, “a second dielectric layer disposed on the planar dielectric layer and the portions of the borophosphorous silicate glass which are not overlaid by the planar dielectric layer, the layers of undoped silicate glass, borophosphorous silicate glass, planar dielectric layer, and a second dielectric layer together composing a pre-metal dielectric stack.”

As to the amended claim 20, Kuo does not teach or suggest, “...a first substantially planar layer of dielectric material covering at least one or more of the recessed portions of the layer of the doped silicate glass, and exposing at least one or more of the extended portions of the layer of the doped silicate glass layer....”

Also as to the amended claim 20, Kuo does not teach or suggest, “a second layer of dielectric material covering the first substantially planar layer of dielectric material and being in direct contact with the at least one or more extended portions of the layer of the doped silicate glass layer.”

In contrast to claims 1, 6, and the amended claim 20, Kuo only teaches or suggests a single layer of plasma-enhanced tetraethyl orthosilicate. Kuo does not teach or suggest use multiple layers of plasma-enhanced tetraethyl orthosilicate, as further described in claim 1 or multiple dielectric layers as further described in claim 6.

Comments on Unexpected Results of Claimed Invention

Specification discusses the advantages and unexpected results achieved by using multiple layers of plasma-enhanced tetraethyl orthosilicate, as further described in claim 1 or multiple dielectric layers as further described in claim 6 and the amended claim 20. The single layer approach in Kuo requires a *planarized* layer of borophosphorous silicate glass over the layer of undoped silicate glass, but problems still exist: the overly thick layer of borophosphorous silicate glass needed and the unevenness even after planarization and non-uniform distribution of dopant through the glass. This thick layer of borophosphorous silicate glass results in a low-throughput with much maintenance (e.g. page 2, line 28 through page 3, line 10).

A thin layer of borophosphorous silicate glass combined with a sacrificial layer of plasma-enhanced tetraethyl orthosilicate of claim 1 or dielectric layer of claims 6 and the amended 20 for the planarizing process, has potential for lower cost and increased quality because it is simpler to manufacture: higher throughput with less intensive pre-cleaning of the semiconductor device and post-processing equipment maintenance. (e.g. page 5, line 16 through page 6, line 2).

Nerwin v. Erlichman

The "Response to Arguments" puts forth a proposition that "the mere fact that a given layer is integral does not preclude its consisting of various elements" and cites *Nerwin v. Erlichman*, 168 USPQ 177, 179 (PTO Bd. Of Int. 1969) ("*Nerwin*") for support. The Applicant will provide detailed explanation below, but for convenience will first briefly state two points. First the Applicant, respectfully submits that *Nerwin* actually stated that "[t]he mere fact that a given **structure** is integral does not preclude its consisting of various different **elements**." *Id.* at 179. Second, the Applicant, respectfully points out that the court in *Nerwin* did **not** mean that a given **structure** that is integral can be composed of various structures. On the contrary, the Court in *Nerwin* referred to various **elements** as having various functional qualities that could be served by various portions of the same integral structure or various non-integral structures. *Id.* at 178-179. The court in *Nerwin* never suggested that a reference having one structure would read on a claim having two limitations directed to two structures.

As background, *Nerwin* dealt with an interference between a reissue application of a senior party and a patent of a junior party. Issues were directed to whether the senior party's specification lacked support for counts (like claims) copied by the senior party from the junior party's patent claims and filed with the senior party's motion to the Primary Examiner.

At issue in *Nerwin* was the senior party's right to make in their count 1 the limitations (1) "a divider between said exposure and processing chamber" and (2) "means effective upon movement of said strip along said first path for denoting the leading edge of each said sheet along a second path branching from said first path... into said exposure chamber." *Id.* at 178.

The junior party contended that these two limitations set forth two separate elements, which were disclosed by the junior party as (1) a divider comprising the roller 44 and the wall 34 and (2) a directing means comprising stripper 43. Furthermore, the junior party contended that these two limitations only found support in the senior party's structure 198 and that the senior party may not use this single element to meet to positively stated and separately claimed elements of the count. *Id.* at 178-179.

The Court found that (1) the senior party's member 198 (1) interposed itself between the strip and the sheet in the same manner as the junior party's roller 44 to divide the paths of the strip and the sheet and (2) the upper portion of the senior party's member 198 performed a function distinct from the dividing function of the tip, namely the function of assisting in guiding the sheet into the exposure chamber. *Id.* at 179. Consequently, the court found that the senior party's No. 198 supported the two "dividing" and "guiding" limitations at issue of count 1 without double reading on the same element or structure. *Id.* at 179. Note that the two elements are functionally oriented in dividing and guiding that could be met by various portions an integral structure or two separate structures. The Court in *Nerwin* did not suggest or imply that an integral structure could be composed of two or more structures. Under this context, the Court, in *Nerwin*, stated that, "[t]he mere fact that a given structure is integral does not preclude its consisting of various elements." *Id.* at 179.

For support, the *Nerwin* court first stated (... the Monumental grate ... maintains all the elements of the Beckwith grate, except that ... it is cast in two pieces, while the Beckwith grate is cast in one piece.") *Howard et al. v. Detroit Steelworks* 150 US 164 (1893), ("*Howard*"). The court in *Howard* found that the elements of the Beckwith grate (U.S. Patent No. 206,074) involved, "the invention of a circular grate having a thin closed portion, a thick open portion, strengthened by ribs, and with a toothed periphery opposite the open part of the grate." *Id.* The *Howard* court found that these elements that had distinct functional connotations could be met whether the grate was cast in one or two pieces. *Id.* The *Howard* court did not state or suggest that one integral structure could be composed of two or more structures.

The *Nerwin* court also cited *Reed v. Edwards*, 101 F.2d 550, (1939), ("*Reed*") ("...while a given structure made in one sense be considered a single element, in another sense it may be so formed as to consist of several elements depending upon the function is to be

performed by such elements.”) Here the *Reed* court distinguished elements in terms of functional connotations and did not suggest or imply that one integral structure could be composed of two or more structures.

In summary, *Nerwin* states that “[t]he mere fact that a given structure is integral does not preclude its consisting of various elements.” *Nerwin, Supra*, at 179. *Nerwin* referred to various elements as having various functional qualities that could be served by various portions of the same structure or various structures. The court in *Nerwin* never suggested that a reference having one structure would read on a claim having two limitations directed to two structures.

In re Jones and In re Fine

The “Response to Arguments” cites *In re Fine*, 837 F.2d 1071, 5 USPQ 2d 1596 (Fed. Cir. 1988) (“*Fine*”) and *In re Jones*, 958 F. 2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992) (“*Jones*”) to provide guidance in obviousness rejections of claims. The Applicant offers the following comments regarding *Fine* and *Jones* to expedite prosecution.

As to *Fine*, the court agreed that “the references applied by the Board and Examiner were improperly combined, using hindsight reconstruction, without evidence to support the combination and in face of the contrary teachings in the prior art.” *Fine, Supra*, at 1074. The *Fine* court went on to state that “the PTO as the burden under section 103 to establish a *prima facie* case of obviousness ... you can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references ... [t]he Board points to nothing in the cited references, either alone or in combination, suggesting or teaching *Fine*’s invention ... [i]nstead, the Examiner relies on hindsight in reaching his obviousness determination. But this court has said, ‘to imbue one of ordinary skill in the art would knowledge of the invention in suit, when no prior art reference or references of record convey or suggest that knowledge, is to fail victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against the teacher.’” *Id.* at 1074-1075.

Since Kuo only teaches or suggests a single layer of plasma-enhanced tetraethyl orthosilicate, Kuo naturally teaches away from use of multiple layers of plasma-enhanced tetraethyl orthosilicate, as further described in claim 1 or multiple dielectric layers as further

described in claims 6 and 20. Since Kuo requires a *planarized* layer of borophosphorous silicate glass over the layer of undoped silicate glass, he teaches away from planarized layer of plasma-enhanced tetraethyl orthosilicate of claim 1 and the planar dielectric layer of claims 6 and 20. Since no references were used in rejecting claims 1, 6 and 20 that taught or suggested the multiple layer and planarized approaches of claims 1, 6 and 20, it would, thus, appear that the insidious effect of a hindsight syndrome has occurred wherein that which only the inventor taught was used against the teacher.

As to *Jones*, “[e]very case, particularly those raising the issue of obviousness under section 103, must necessarily be decided upon its own facts.” *Jones, Supra*, at 350. In our present instance, a prior art reference has one structure whereas the claimed invention has two structures, yet the “Response to Arguments” is using *Nerwin*, to guide claim interpretation even though *Nerwin* deals with an issue involving one structure having two functions versus two structures having two functions.

Jones further states that “[a]nd in any event, this court has previously stated that generalization is to be avoided insofar as specific structures are alleged to be *prima facie* obvious one from the other.” *Id.* at 350. In other words, until someone in the prior art actually uses two structures made of a material in place of one made of the same material, it is not proper to conjecture that replacing one with two would be “obvious.”

Jones additionally comments, “[c]onspicuously missing from this record is any *evidence* other than the PTO’s speculation (if it be called evidence) that one of ordinary skill in the herbicidal art would have been motivated to make the modifications of the prior art salts necessary to arrive at the claimed 2-(2'-aminoethoxy) ethanol salt.” *Id.* at 351. In the case at hand the “Response to Arguments” merely states that “separating what was formerly a singularly or into separate layers” would be obvious to one of ordinary skill in the art since based on the differences and the unapparent unexpected results. The Applicant respectfully requests that the statements previously made about differences and unexpected results (made again above) be reconsidered.

If the Examiner still considers that aspects of the claimed invention to be obvious to one of ordinary skill in the art, then following the comments found in *Jones*, the Examiner should provide *evidence*, which would most likely be in the form of a signed affidavit by one

attesting to having what was considered ordinary skill in the art at the time of the invention and attesting that those aspects of the claimed invention deemed "obvious" would have been indeed obvious to one of ordinary skill in the art at the time of the invention. The Applicant respectfully points out that it is doubtful that the Examiner himself possesses the ordinary skill in the art that was at the time of the invention since when the Applicant's attorney personally met with the Examiner to discuss how to draft claim amendments to overcome Kuo (the reference presently being used in the obviousness rejections of the claims), the present obviousness issues were never raised.

The Applicant respectfully submits that independent claims 1, 6, and 20 are now in condition for allowance. Dependent claims 2-4, 7, 9-10, and 22-27 are also in condition for allowance and also for other reasons. For instance, claim 4 teaches a combined thickness of the oxide layer, the layer of undoped silicate glass, the layer of borophosphorous silicate glass, and the second layer of plasma-enhanced tetraethyl orthosilicate is less than approximately 15k angstroms, which is not taught or suggested by Kuo and for other reasons discussed above.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "**Version With Markings to Show Changes Made.**" The Applicant respectfully proposes that all of the claims remaining in the application are now allowable. Favorable consideration and a Notice of Allowance are earnestly solicited.

Respectfully submitted,
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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Claims:

Claim 21 has been canceled.

Claim 20 has been amended as follows:

20. (Amended) A semiconductor device sub-structure, comprising:

a substrate;

an oxide layer disposed over the substrate in a pattern having a physical contour of at least one or more recessed portions and at least one or more extended portions;

a layer of undoped silicate glass disposed over the patterned oxide layer and having a physical contour of recessed and extended portions corresponding to the physical contour of the oxide layer;

a layer of doped silicate glass over the layer of undoped silicate glass and having a physical contour of recessed and extended portions corresponding to the physical contour of the layer of undoped silicate glass; ~~and~~

a first substantially planar layer of dielectric material covering at least one or more of the recessed portions of the layer of the doped silicate glass, and exposing at least one or more of the extended portions of the layer of the doped silicate glass layer; and

a second layer of dielectric material covering the first substantially planar layer of dielectric material and being in direct contact with the at least one or more extended portions of the layer of the doped silicate glass layer.

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